

this specification. Forward of ear 232 is another picker bracket pivot support portion or ear 236. Ears 232 and 236 pivotally support the flipper and picker mechanisms 122 and 160 on top of the traverse mechanism 300 discussed below.

The drive loader mechanisms 272 are visible in FIGS. 5, 6, 10, 11, 15, 17, and 19-21. The drive motor mechanisms 272 are mirror images of each other and are located below the picker mechanism 160 and in front of the optical disk drives 20, and particularly their respective slots 26. A single drive loader mechanism 272 will be described.

An adjustable bracket 274 is mounted on base plate 34 and supports a drive loader motor 276. The motor 276 rotates shaft 278 upon which are located a load arm 280 and a load arm flag 284. Below load arm 280 is an adjustable stop 282. Load arm flag 284 appropriately has a retracted edge 286 and an extended edge 288 which will pass through the load arm photointerruptor 290 which will stop and reverse motor 276. By this arrangement, load arm 280 may be rotated up through the slots 127 and 131 of the flipper mechanism 122 after the picker mechanism 160 has moved the cartridge 10 until the leading edge 188 of flag 186 has interrupted sensor 228 after which the load arm 280 pushes the cartridge 10 into the optical disk drive 20 and then returns to its retracted position (see FIGS. 20 and 21).

FIGS. 5, 6, and 10-19 clearly depict the traverse mechanism 300. Traverse mechanism 300 includes right side support plate 302 and left side support plate 304 opposing each other and mounted on base plate 34. Support plate 302 has a right flipper mechanism support arm 306 which will receive flipper lay right stop 158 on flipper bracket 140. Left support plate 304 has a left flipper mechanism support arm 308 which will support flipper lay left stop 159 on bracket 140. Right plate 302 also supports a traverse lay right photointerruptor 310 which works with flipper flag 157 on bracket 140 to inform the apparatus 31 that the flipper mechanism 122 is in the lay right position. Left plate 304 supports the traverse lay left photointerruptor 312 which similarly works with flipper flag 157 to inform the apparatus 31 of the flipper mechanism 122 being in the lay left position.

Between right and left side support plates 302 and 304 is forward traverse guide shaft 316 and rear traverse guide shaft 318 along with a stationary timing belt 320 which is held onto plates 302 and 304 at its distal ends by ways of right plate belt fastener 322 and left plate belt fastener 324 suitably being affixed to plates 302 and 304. Forward traverse guide block 326 has an aperture 328 therethrough suitably with bushing 330 therein. Forward traverse guide shaft 316 passes through bushing 330. Rear traverse guide block 332 also has aperture 334 wherein bushing 336 is located. Rear traverse guide shaft 318 passes through bushing 336. Fixed to rear traverse guide block 332 is traverse home flag 338 which will pass into traverse home photointerruptor 339 when the traverse mechanism is all the way to the right or in its home or zero position for initialization.

Guide blocks 326 and 332 have a traverse base plate suitably fastened to their bottom sides which appropriately may have a timing belt opening 342 suitably to permit timing belt 320 to pass therethrough as explained below. Traverse base plate 340 supports a forward traverse pivot support plate 344 and a rear traverse pivot support plate 346 which suitably align adjacent with the support portions or ears 232 and 236 of the picker mechanism

anism bracket 162. Below base plate 340 is located a traverse motor mount 348 which supports a motor 350 with a shaft which has an encoder 352 thereon. Drive pulley 354 is connected to motor 350 and has the stationary timing belt 320 wrapped therearound from which the belt 320 extends upwardly through belt opening 342 in traverse base plate 340 and is wrapped around right idler pulley 356 and left idler pulley 358, respectively.

Idler pulleys 356 and 358 are supported on shafts 360 which extend through and from rear pivot support plate 346. The encoder 352 counts the revolutions of motor 350. After initialization of the traverse mechanism 300, the encoder 352 provides the apparatus 31 with information as to the exact location of the traverse mechanism with respect to the base plate 34 of the apparatus 31 along stationary timing belt 320.

Traverse pivot means or motor 362 is appropriately fixed to or mounted on rear traverse pivot support plate 346. The shaft 364 of pivot motor 362 is keyed into configured hole 234 of picker bracket pivot support ear 232 which thereby will pivot the picker mechanism to the lay right or lay left position.

As explained, the pivot motor 362 drives the lay left or lay right pivot motion of the flipper mechanism 122 from the rear traverse pivot support plate 346. The cam arrangement now to be discussed assists in the lay left and lay right pivot motion of the flipper mechanism 122 together with its position sensing ability. Pivot pin 366, upon which the flipper mechanism 122 passively pivots, passes through forward pivot support plate 344, forward picker bracket pivot support ear 236 and cam 368. Cam 368 has a cam screw or rivet 370 securing the cam 368 to the forward picker bracket pivot support ear 236. Cam 368 has a cam surface 372 with detents 374, 376 and 378. Detent 374, when engaged with cam follower 388, is indicative of the transverse mechanism 300 being in upright position (FIGS. 11 and 12). Detent 376, when engaged with the cam follower 388, is indicative of the traverse mechanism 300 being in the lay right position (FIGS. 14 and 15). Detent 378, when engaged with the cam follower 388, is indicative of the traverse mechanism being in the lay left position (FIGS. 17-19).

On the cam 368 is located a cam spring pin 380 connecting a cam spring 382 to the cam spring anchor plate 384. The cam spring 382 is oriented to assist the traverse mechanism 300 in smoothly and easily moving to its lay left or lay right position while somewhat biasing the traverse mechanism 300 in its vertical orientation. FIGS. 12-14 and 18 show the cam arrangement in the detail. The traverse pivot motion photointerruptor 386 is mounted on the cam spring anchor plate 384. The cam follower 388 supports a cam flag 390 and has a cam follower arm 392 extending away from the follower 388. The cam follower arm 392 is pivotally mounted to the forward traverse pivot support plate 344 and is biased by the cam follower arm spring 396 which is anchored at 398.

By this arrangement, the biased cam follower 388 rides on the cam surface 372. When the cam follower 388 is within any of the three detents 374, 376 and 378, the cam flag 390 is not within the photointerruptor 386. However, when the traverse mechanism 300 pivots or begins to lay left or lays right, the cam follower 388 is on the cam surface 372 and the cam flag 390 is within the traverse pivot motion photointerruptor 386 to inform the apparatus 31 of the flipper mechanism's 122